PAP. & PROC. ROY. SOC. TASMANIA, VOL. 87 (15TH AUGUST, 1953)

Further Observations on the Intertidal Ecology of the Freycinet Peninsula

By

ERIC R. GUILER

Department of Zoology, University of Tasmania

SUMMARY

This paper is the tenth of a series on the intertidal ecology of Tasmania and it records two important changes in the zonation seen on both the exposed and sheltered coasts. The barnacle belt on the exposed shore has become more densely populated while on the sheltered coast *Mytilus planulatus* has gained ascendancy over *Hormosira*. These changes have led to an alteration in the basic zonation of the shores as well as in the composition of the fauna of the belts concerned.

INTRODUCTION

The intertidal ecology of exposed coasts has been described in three previous papers. Two of these (Guiler, 1951a, and 1952a) are concerned with surveys of areas while the third paper (Guiler, 1952b) compares the zonation of exposed coasts with that seen on other types of Tasmanian coastlines.

The field work necessary for these papers was carried out three years ago and all the first described areas have been re-visited during the summer of 1953. Freycinet Peninsula was first visited during February, 1950 and during the re-examination, all of the original transects were studied and changes noted.

(a) The exposed shore at Sleepy Bay.

In the Supralittoral fringe the mollusc *Melaraphe unifasciata* (Gray) was still the only macroscopic organism in the zone. The littorinid appeared to be present in much greater numbers than on the previous visits though the width of the belt is no greater. It is not possible to define the upper limit of the zone due to the discontinuous distribution of the species.

The Midlittoral shows a profound change in that there has been a large increase in the number of barnacles found on the shore. The barnacles in 1950 were few in number but by 1953 they had increased to about three times their previous numbers and they were no longer confined only to cracks but were to be found on the general surface of the rocks. The shore was not covered by a continuous sheet of barnacles but the cirripedes covered patches of rock up to two square feet in area. The evidence seems to point to some sort of barnacle destruction prior to 1950 from which the species are just recovering. *Chamaesipho columna* Spengler is the most common species with *Chthamalus antennatus* and *Elminius simplex* Darwin.

The actual width of the belt, both vertical and horizontal, is no greater than in 1950.

The tube worm *Galeolaria caespitosa* (Lam.) was also present in greater numbers, especially in cracks and between rocks. However, the species is not present in sufficient numbers to form a belt.

By contrast, the Patelloid belt is not as well developed as in 1950. In some places where the belt was previously encountered, it is now absent, though in other places it is still very well developed. The Coralline belt is still present and there has been no change in the Infralittoral Fringe.

(b) The Honeymoon beaches

In the 1951 paper it was noted that the Midlittoral rocks at Honeymoon Beach No. 3 (Transect 12) were populated by *Hormosira banksii* (Turn.), Decaisne and *Mytilus planulatus* (Lam.) and that these species were in intense interspecific competition (see Pl. 3 of 1951 paper). In 1953 this situation had altered and the mussels formed a belt around the shore and have assumed dominance at the expense of the alga.

The small mussel *Brachyodontes rostratus* (Dunker) which formed a band in 1950 around the shore above the *Galeolaria* band had increased in numbers by 1953, forming in some places a dense cover to the rocks. Similarly, *Galeolaria* had also increased from a band of scattered tubes to a uniform covering of tubes on the rocks. There was no evidence of a thick incrustation developing.

The ascidian *Pyura stolonifera* (Heller) = *Pyura praeputialis* (see Kott 1952) has increased in numbers, especially on the stones in the Infralittoral.

Discussion

The most important feature has been the dominance achieved in the Midlittoral by *Mytilus* at the expense, and almost to the exclusion of *Hormosira*. This is in direct contrast to the evidence present by recolonization experiments carried out at Blackman's Bay where *Mytilus* showed a very low rate of successful settlement. Similarly, the spread of mussels, both *Mytilus* and *Brachyodontes*, *Galeolaria* and barnacles supports my contention that a major catastrophe had taken place shortly prior to 1950 and these species are slowly re-establishing themselves.

The relatively rapid spread of *Mytilus* could have been achieved by a successful heavy spatfall or spatfalls, aided by favourable seasons. Since November, 1952, when the Blackman's Bay mussel beds were virtually annihilated the mussels have almost recolonized the whole area which is a further contrast to the results of the recolonization experiments. I cannot advance any satisfactory reason for the rapid and successful recolonization, either at Blackman's Bay or Coles Bay.

The basic zonation at Coles Bay no longer includes *Hormosira* which has been reduced to the status of " another species ". The zonation is now as follows:—

Melaraphe
Chamaesipho and *Austrocochlea*
Brachyodontes
Galeolaria
Mytilus
Corallina
Cystophora

The zonation on the exposed coast is not altered but it has been rendered more obvious by the greater population of the barnacle belt.

The greater density of population on the exposed coast will have led to a larger number of individuals which can shelter around the barnacles but the complete change of dominant species at Coles Bay will have led to more profound changes. *Hormosira* does not support a large fauna or flora but mussels support a large number of species which live below them, such as crabs, annelids, flatworms and other molluscs. Similarly a number of algae live attached to the shells of the mussels and barnacles also settle on lamellibranchs.

These observations stress the necessity of frequently visiting shores which are described as type ecological areas and so noting the ecological changes occurring thereon.

References

GUILER, E. R., 1951*a*.—Notes on the intertidal ecology of the Freycinet Peninsula. *Pap. Roy. Soc. Tasm.* 1950 (1951) pp. 53-70.

————————, 1952*a*.—The intertidal ecology of the Eaglehawk Neck area. *Pap. Roy. Soc. Tasm.* 1951 (1952) pp. 13-29.

————————, 1952*b*.—The nature of intertidal zonation in Tasmania. *Pap. Roy. Soc. Tasm.* 1951 (1952) pp. 31-61.

KOTT, P., 1952.—The ascidians of Australia. 1. Stolidobranchiata. *Austr. J. Mar. Freshw. Res.* 3, 3, 1952 pp. 205-334.